

*B1* *volume*  
*ant* 14. A device for coupling ultrasonic waves into a solid body to be  
ultrasonically probed via a boundary surface located outside a closed body  
comprising:

*USB*  
*USB*  
*as* including at least one ultrasonic-wave transducer unit, which couples  
ultrasonic waves into the solid body via a gaseous coupling medium provided  
between the at least one ultrasonic-wave generating unit and the boundary surface,  
wherein the ultrasonic waves generated by the at least one ultrasonic transducer  
unit are directed into the closed volume, which is provided with at least a first  
opening and a second opening; and

a flow of gas providing an overpressure inside the closed volume which  
is directed into an interior of the closed volume through the first opening, and which  
exits the closed volume through the second opening which directly faces the  
boundary surface.

*USB*  
*USB* 15. The device according to claim 14, wherein the closed volume is  
bordered by a housing in which the ultrasonic transducer is contained to cause the  
ultrasonic waves to be directed at the opening directly facing the boundary surface.

16. The device according to claim 14, wherein the flow of gas is air.

17. The device according to claim 16, wherein the flow of air is compressed air.

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18. The device according to claim 15, wherein the flow of gas is air.

19. The device according to claim 18, wherein the flow of air is compressed air.

20. The device according to claim 17, comprising a compressed air line connected to the first opening.

21. The device according to claim 19, comprising a compressed air line connected to the first opening.

22. The device according to claim 15, wherein the housing includes a surface provided with at least the second opening facing the boundary surface.

23. The device according to claim 16, wherein the housing includes a surface provided with at least the second opening facing the boundary surface.

24. The device according to claim 17, wherein the housing includes a surface provided with at least the second opening facing the boundary surface.

25. The device according to claim 18, wherein the housing includes a surface provided with at least the second opening facing the boundary surface.

26. The device according to claim 19, wherein the housing includes a surface provided with at least the second opening facing the boundary surface.

27. The device according to claim 20, wherein the housing includes a surface provided with at least the second opening facing the boundary surface.

28. The device according to claim 21, wherein the housing includes a surface provided with at least the second opening facing the boundary surface.

29. The device according to claim 14, comprising sound conducting means for coupling ultrasonic waves inside the closed volume toward the second opening.

30. The device according to claim 15, comprising sound conducting means for coupling ultrasonic waves inside the closed volume toward the second opening.

31. The device according to claim 16, comprising sound conducting means for coupling ultrasonic waves inside the closed volume toward the second opening.

32. The device according to claim 17, comprising sound conducting means for coupling ultrasonic waves inside the closed volume toward the second opening.

33. The device according to claim 20, comprising sound conducting means for coupling ultrasonic waves inside the closed volume toward the second opening.

34. The device according to claim 22, comprising sound conducting means for coupling ultrasonic waves inside the closed volume toward the second opening.

35. The device according to claim 29, wherein the sound conducting means separates a first spatial zone inside the closed volume, in which ultrasonic waves propagate without interference with the flow of gas, and a second spatial zone in which the gas flow is directed.

36. The device according to claim 34, wherein the sound conducting means comprises a funnel which guides the ultrasonic waves from the ultrasonic transducer to the second opening without being impeded by the flow of gas.

37. The device according to claim 22, wherein the flow of gas passes through the second opening facing the boundary surface and flows between an upper side of the housing facing the boundary surface and the boundary surface extends radially relative to the second opening, and a vacuum draws the housing toward the boundary surface to create a gas cushion of a thickness at which a force of attraction is created by the vacuum and a force of repulsion present due to a mass impulse of the flow of gas between the housing and the boundary surface are in equilibrium.

38. The device according to claim 29, wherein the flow of gas passes through the second opening facing the boundary surface and flows between an upper side of the housing facing the boundary surface and the boundary surface extends radially relative to the second opening, and a vacuum draws the housing toward the boundary surface to create a gas cushion of a thickness at which a force of attraction is created by the vacuum and a force of repulsion present due to a mass impulse of the flow of gas between the housing and the boundary surface are in equilibrium.

39. The device according to claim 35, wherein the flow of gas passes through the second opening facing the boundary surface and flows between an upper side of the housing facing the boundary surface and the boundary surface extends radially relative to the second opening, and a vacuum draws the housing toward the boundary surface to create a gas cushion of a thickness at which a force of attraction is created by the vacuum and a force of repulsion present due to a mass impulse of the flow of gas between the housing and the boundary surface are in equilibrium.

40. The device according to claim 36, wherein the flow of gas passes through the second opening facing the boundary surface and flows between an upper side of the housing facing the boundary surface and the boundary surface extends radially relative to the second opening, and a vacuum draws the housing toward the boundary surface to create a gas cushion of a thickness at which a force of attraction is created by the vacuum and a force of repulsion present due to a

mass impulse of the flow of gas between the housing and the boundary surface are in equilibrium.

41. The device according to claim 14, wherein the transducer comprises a transmitter and a receiver.

42. The device according to claim 14, wherein the solid body into which the ultrasonic waves are coupled is biological tissue.

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